

## CLAIMS

What is claimed is:

1. A method for treating a patient with chronic pain, comprising:  
providing at least one leadless stimulator having at least two electrodes;  
implanting the at least one stimulator adjacent to at least one peripheral nerve at least in part responsible for sensations in a region experiencing chronic pain;  
providing operating power to the at least one stimulator;  
using at least one external appliance to transmit stimulation parameters to the at least one stimulator;  
receiving and storing the stimulation parameters;  
generating stimulation pulses in accordance with the stimulation parameters; and  
delivering the stimulation pulses to nerves adjacent to the at least one stimulator;  
wherein the stimulator has a size and shape suitable for placement of the electrodes adjacent to the at least one peripheral nerve.
2. The method of Claim 1 wherein the stimulation pulses are delivered at less than about 1-10 mA.
3. The method of Claim 2 wherein the stimulation pulses are delivered at less than about 100 to 150 Hz.
4. The method of Claim 1 wherein the at least one peripheral nerve comprises at least one of an ulnar nerve, an ulnar nerve branch, a musculocutaneous nerve, a musculocutaneous nerve branch, a median nerve, a median nerve branch, a radial nerve, a radial nerve branch, a medial cutaneous nerve, an intercostobrachial nerve, a common peroneal nerve, a common peroneal nerve branch, a posterior cutaneous nerve, a posterior cutaneous nerve branch, a sciatic nerve, a sciatic nerve

branch, a sural nerve, a sural nerve branch, a saphenous nerve, a saphenous nerve branch, an obturator nerve, an obturator nerve branch, a femoral nerve, a femoral nerve branch, a lateral cutaneous nerve, a lateral cutaneous nerve branch, an intercostal nerve, an intercostal nerve branch, a greater occipital nerve, a lesser occipital nerve, and a third occipital nerve.

5. The method of Claim 4 wherein the stimulation pulses are delivered at less than about 1-10 mA.

6. The method of Claim 5 wherein the stimulation pulses are delivered at less than about 100 to 150 Hz.

7. The method of Claim 1 wherein the chronic pain is located in one or both upper limbs, and the at least one stimulator is implanted adjacent to at least one nerve fiber of an ulnar nerve, an ulnar nerve branch, a musculocutaneous nerve, a musculocutaneous nerve branch, a median nerve, a median nerve branch, a radial nerve, a radial nerve branch, a medial cutaneous nerve, and an intercostobrachial nerve.

8. The method of Claim 1 wherein the chronic pain is located in one or both lower limbs, and the at least one stimulator is implanted adjacent to at least one nerve fiber of a common peroneal nerve, a common peroneal nerve branch, a sciatic nerve, a sciatic nerve branch, a saphenous nerve, a saphenous nerve branch, a posterior cutaneous nerve, a posterior cutaneous nerve branch, a sural nerve, a sural nerve branch, an obturator nerve, an obturator nerve branch, a femoral nerve, a femoral nerve branch, a lateral cutaneous nerve, and a lateral cutaneous nerve branch.

9. The method of Claim 1 further comprising  
providing at least one sensor;  
using the at least one sensor to sense a physical condition; and  
determining the stimulation parameters based upon the sensed condition.

10. The method of Claim 9 wherein the at least one sensor is a part of the stimulator.

11. The method of Claim 1 further comprising providing and implanting more than one stimulator.

12. A method for treating a patient with chronic pain, comprising the steps of:  
providing at least one means for stimulating tissue;  
implanting the at least one stimulating means near at least one peripheral nerve at least in part responsible for sensations in a region experiencing chronic pain;  
providing operating power to the at least one stimulating means;  
transmitting stimulation parameters to the at least one stimulating means using at least one external appliance;  
receiving and storing the stimulation parameters;  
generating stimulation pulses in accordance with the stimulation parameters; and  
delivering the stimulation pulses to nerves adjacent to the at least one stimulating means;  
wherein the stimulating means has a size and shape suitable for placement near the at least one nerve and has leads up to 150 mm long.

13. The method of Claim 12 wherein the body of the stimulator is no more than 150 mm from the at least one nerve to be stimulated.

14. The method of Claim 13 wherein the at least one peripheral nerve comprises at least one of an ulnar nerve, an ulnar nerve branch, a median nerve, a median nerve branch, a radial nerve, a radial nerve branch, a common peroneal nerve, a common peroneal nerve branch, a sciatic nerve, a sciatic nerve branch, a saphenous nerve, a saphenous nerve branch, an intercostal nerve, and an intercostal nerve branch.

15. A method for treating a patient with chronic pain, comprising:  
providing at least one leadless stimulator having at least two electrodes;  
providing at least one sensor;  
implanting the at least one stimulator adjacent to at least one peripheral nerve at least in part responsible for sensation in a region experiencing chronic pain;  
providing operating power to the at least one stimulator;  
using the sensor to sense a physical condition;  
determining stimulation parameters based upon the sensed condition;  
generating stimulation pulses in accordance with the stimulation parameters; and  
delivering the stimulation pulses to nerves adjacent to the at least two electrodes;  
wherein the stimulator has a size and shape suitable for placement of the electrodes adjacent to the at least one nerve.
16. The method of Claim 15 wherein the at least one sensor is a part of the stimulator.
17. The method of Claim 15 wherein the stimulation parameters are determined using at least one external appliance.
18. The method of Claim 15 wherein providing power to the at least one stimulator comprises receiving power from at least one external appliance.
19. The method of Claim 18 wherein providing power to the at least one stimulator further comprises storing the power received from the at least one external appliance.
20. The method of Claim 15 further comprising providing and implanting more than one stimulator.

21. The method of Claim 15 wherein the sensor senses at least one of electrical activity of a nerve, electrical activity of the brain, muscle activity, and patient mobility.

22. The method of Claim 15 wherein the sensor senses at least one of sympathetic discharge, medication level, neurotransmitter level, hormone level, cytokine level, neuropeptide level, endorphin level, enzyme level, level of a bloodborne substance, level of a substance in the cerebrospinal fluid, and level of a substance in the local interstitial fluid.

23. A system for treating a patient with chronic pain, comprising:  
at least one leadless stimulator having at least two electrodes;  
means for implanting the at least one stimulator adjacent to at least one peripheral nerve at least in part responsible for sensations in a region experiencing chronic pain;  
means for providing operating power to the at least one stimulator;  
at least one external appliance used to transmit stimulation parameters to the at least one stimulator;  
means for receiving and storing the stimulation parameters; and  
means for generating stimulation pulses in accordance with the stimulation parameters;  
wherein the at least two electrodes deliver the stimulation pulses to nerves adjacent to the at least one stimulator; and  
wherein the stimulator has a size and shape suitable for placement of the electrodes adjacent to the at least one peripheral nerve.

24. The system of Claim 23 further comprising:  
at least one sensor for sensing a physical condition; and  
means for determining the stimulation parameters based upon the sensed condition.

25. The system of Claim 24 wherein the sensor includes means for sensing at least one of electrical activity of a nerve, electrical activity of the brain, muscle activity, and patient mobility.

26. The system of Claim 24 wherein the sensor includes means for sensing at least one of sympathetic discharge, medication level, neurotransmitter level, hormone level, cytokine level, neuropeptide level, endorphin level, enzyme level, level of a bloodborne substance, level of a substance in the cerebrospinal fluid, and level of a substance in the local interstitial fluid.